<u>REMARKS/ARGUMENTS</u>

Favorable reconsideration of the present application is respectfully requested.

Claim 1 has been amended to set forth the unpredictable improved result of cracking resistance for the produced product, as evidenced in Table 4.

Claims 1-4 and 6-14 were newly rejected under 35 U.S.C. §103 as being obvious over Ford et al in view of Tsuruta and any one of U.S. patent 6,495,260 (Takasaki), U.S. patent 6,939,383 (Eastin et al), or Japanese patent publication JP 60-204302 (JP '302). Additionally, Claims 12 and 13 were rejected under 35 U.S.C. §103 as being obvious over the aforementioned references and Japanese patent publication 2000-238023. According to the Office Action, Ford et al teaches all of the claimed features other than producing a ceramic sheet with a thickness of between 1 and 10 millimeters, but that this would have been obvious in view of Tsuruta. Also, the claimed range for the size of the kneading portion was considered to have been *prima facie* obvious in view of Takasaki, Eastin et al or JP '302.

Applicants had previously pointed out that the specification provides evidence that limiting the size of the kneading portion of the twin screw extruder, whose outlet is connected to the material feed opening of a single screw extruder, to the claimed proportional size provides an unpredictable or unexpected improvement in the cracking resistance of a thin ceramic sheet produced thereby. For example, Comparative Example 2 of Table 1 had a kneading portion proportional length of 80% and failed to produce the highest level of cracking resistance. See, e.g., Table 4 wherein the crack designation "2" for Comparative Example 2 is inferior to the crack designation "3" achieved by the inventive examples 1 and 3. See also lines 5-14 of page 36.

It is Applicants' understanding that only Takasaki was cited as a reference whose specification discloses a kneading portion of an extruder occupying from 30 to 70 vol% of the extruder. It is undisputed that this is not taught in Ford, and Eastin et al was apparently

cited for the general teaching that the size of mixing elements can be selected to provide a uniform mixture.

JP '302 was cited to suggest "kneading blocks within the claimed range." This is evidently based on the dimensions in the figures and not a disclosure in the specification. However, the examiner is respectfully reminded that: "[w]hen the reference does not disclose that the drawings are to scale and is silent as to dimensions, arguments based on measurement of the drawing features are of little value." MPEP 2125.

Example 4 in Takasaki describes that the length of a kneading portion in a 600 mm twin screw extruder is 6D where D = 50 mm, whereby the length of a kneading portion is 300 mm -- 50% of the extruder length. However, this does not represent the length of the kneading portion of a twin screw extruder that feeds a single screw extruder to produce a ceramic sheet having a specified thickness ("a discharge outlet of a twin screw extruder and a material feed opening of a single screw extruder are connected"). Instead, the output of the twin screw extruder in Example 4 of Takasaki is fed to a roll to produce the sheet.

The Office Action nonetheless considers that the prior art in combination is sufficient to set forth a *prima facie* case of obviousness. This is respectfully traversed.

JP '302 cannot support a *prima facie* case of obviousness for the claimed dimension of the kneading portion since its purported teaching must be drawn from the sizes of the kneading elements in the drawings, which is insufficient as a matter of law. MPEP 2125.

Takasaki cannot teach that the kneading portion of a twin screw extruder that feeds a single screw extruder to produce a ceramic sheet having a specified thickness should occupy from 30 to 70 vol% of the twin screw extruder since the output of the twin screw extruder in Example 4 of Takasaki is fed to a roll to produce the sheet.

Further, the general description in Eastin et al that the size of mixing elements can be selected to provide a uniform mixture is not a teaching that the proportional length of the

mixing elements in a twin screw extruder that feeds a single screw extruder to produce a ceramic sheet having a specified thickness is a result effective parameter for producing an improved result. See MPEP 2144.05(II)(B). For example, one skilled in the art would not be motivated by the teachings of Eastin et al (or JP '302 or Takasaki) to perform experiments in which the proportional length of the mixing elements in a twin screw extruder that feeds a single screw extruder is varied with an eye toward optimizing the cracking resistance of the produced product.

In any case, the Office Action only asserts the presence of a *prima facie* case of obviousness. Any such *prima facie* case of obviousness may be rebutted by evidence of criticality for the claimed range. MPEP 2144.05(III). The prior response had pointed to the evidence of criticality in the specification for crack resistance, as noted above. This improved result is now also recited in the claims. Such evidence was not addressed or rebutted in the Office Action and is believed to rebut any *prima facie* case of obviousness that may be raised by the cited prior art.

Applicants wish to than Examiner Wollschlager for the courtesy of an interview on November 30, 2010 at which time the present application was discussed. At that time, Applicants emphasized the improved result results such as viscosity and crack resistance set forth at examples 1-3 of the Tables. In response, the examiner noted that the crack resistance grade (i.e., "2") of the inventive examples 7, 14, 16, 17, 19 and 20 in Table 4 was the same as that of the comparative example 2. However, it is noted that the 80 vol% of the extruder in comparative example 2 generated excessive heat, leading to reduced fluidity (see paragraph bridging pp. 10-11). As a result, this example had excessive viscosity (3,500 pa·sc; see Table 2).

It is respectfully requested that the withdrawn dependent claims also be included in any patent issuing from this application.

Applicants therefore believe that the present application is in a condition for

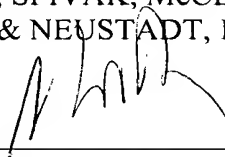allowance and respectfully solicit an early notice of allowability.

Respectfully submitted,

Customer Number

22850

Tel: (703) 413-3000
Fax: (703) 413 -2220
(OSMMN 08/09)

OBLON, SPIVAK, McCLELLAND,
MAIER & NEUSTADT, L.L.P.

_____

Robert T. Pous
Registration No. 29,099
Attorney of Record